

Claims

1. A process for the conditioning of liquefied natural gas, which comprises applying the following steps to a feed stream of liquefied natural gas:
 - i. vaporizing at least a major portion of the feed stream of liquefied natural gas to produce an at least partially vaporized natural gas stream;
 - ii. separating the at least partially vaporized natural gas stream to produce a first stream which is rich in methane and a second stream which is rich in hydrocarbons having two or more carbon atoms;
 - iii. if required, compressing the first stream from step (ii) to increase the pressure and produce a compressed gas stream;
 - iv. cooling the compressed gas stream from step (ii) or (iii) by heat exchange with at least part of the feed stream of liquefied natural gas to produce a liquid compressed gas stream;
 - v. passing the second stream from step (ii) without pumping to a distillation vessel to produce a natural gas liquids stream and a stream rich in methane, the operating pressure of the distillation vessel being such that the stream rich in methane exits the distillation vessel at a pressure in the range of from 2 to 6 barg;
 - vi. cooling the stream rich in methane from step (v) by heat exchange with at least part of the feed stream of liquefied natural gas and subsequently pumping to produce a liquid compressed gas stream;
 - vii. optionally combining the liquid compressed gas streams from steps (ii) or (iii) and (vi);
 - viii. vaporizing the liquid compressed gas streams from steps (iv), (vi) and/or (vii) to

- ix. produce a conditioned natural gas; and
- x. recovering the natural gas liquids.

2. A process as claimed in claim 1, in which in step (v) the stream rich in methane exits the distillation vessel at a pressure in the range of from 3 to 5 barg.
3. A process as claimed in either claim 1 or claim 2, in which the separation of step (ii) is carried out using a separator with no reflux streams and containing no packing materials or gas-liquid separation trays.
4. A process as claimed in any one of claims 1 to 3, in which the distillation column used in step (v) contains gas-liquid separation packing or trays and is operated without the presence of a reflux stream.
5. A process as claimed in any one of claims 1 to 4, in which in excess of 90% of the feed stream to the process is processed in step (i), none of said feed stream being used to act as a reflux in any column used in the process.
6. A process as claimed in any one of claims 1 to 5, in which, following the heat exchange of steps (iv) and (vi), the gas stream originating from step (v) is compressed to equalise its pressure with that of the higher-pressure stream originating from step (ii)/(iii), and the two streams are combined.
7. A process as claimed in claim 6, in which said combined stream is pumped to increase the pressure and subsequently vaporized.
8. A process as claimed in any one of claims 1 to 7, in which the distillation vessel in step (ii) is provided with a reboiler which uses seawater as coolant.
9. A process as claimed in any one of claims 1 to 8, in which the input pressure of the at least partially vaporized natural gas stream into step (ii) is in the range of from 9 to 13 barg.
10. A process according to any one of claims 1 to 9, in which the temperature of the feed stream of liquefied natural gas is in the range of from -170 to -150°C.
11. A process as claimed in any one of claims 1 to 10, in which the heat exchanger(s) used in steps (ii)/(iii) and (v) is/are a plate-fin exchanger(s).